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# **Data Structure**

## **CS 322**

**Functions and Pointers**

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# Functions

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```
type name ( parameter1, parameter2, ...)  
{  
statement1;  
statement2;  
:  
:  
}
```

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# LAB#4

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## **Exercise#1:**

Trace the following code:

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```
// function example
#include <iostream>
using namespace std;

int subtraction (int a, int b)
{
    int r;
    r=a-b;
    return (r);
}

int main ()
{
    int x=5, y=3, z;
    z = subtraction (7,2);
    cout << "The first result is " << z << '\n';
    cout << "The second result is " << subtraction (7,2) << '\n';
    cout << "The third result is " << subtraction (x,y) << '\n';
    z= 4 + subtraction (x,y);
    cout << "The fourth result is " << z << '\n';
    return 0;
}
```

# LAB#4

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## Exercise#2:

Write a program which has the function ***addition***. Addition should be as follows:

- takes 2 parameters of type integer: **3,5**
- performs the addition operation
- and then returns the result.

Print out the result in the main function.

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# LAB#4

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## Exercise#3: (passing parameters by reference)

Write a program which takes 3 integer values from the user, pass them by reference into function ***duplicate*** which multiplies the values by 2, and then in the main function, print out the values after duplication.

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C:\Windows\system32\cmd.exe

Please enter 3 integers to be duplicated:

Value1: 3

Value2: 4

Value3: 6

The values after duplication are:

6

8

12

Press any key to continue . . .

```
// passing parameters by reference
#include <iostream>
using namespace std;

void duplicate (int& a, int& b, int& c)
{
    a*=2;
    b*=2;
    c*=2;
}

int main ()
{
    int x,y,z;
    cout<< "Please enter 3 integers to be duplicated:"
        << endl
        << "Value1: ";
    cin>> x;
    cout<< "Value2: ";
    cin>> y;
    cout<< "Value3: ";
    cin>> z;
    duplicate (x, y, z);
    cout<< "The values after duplication are: \n"
        << x <<endl << y <<endl << z << endl;
    return 0;
}
```



# LAB#4

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Trace the following program:

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```
- // more than one returning value
#include <iostream>
using namespace std;

- void prevnext (int x, int& prev, int& next)
{
    prev = x-1;
    next = x+1;
}

- int main ()
{
    int x=100, y, z;
    prevnext (x, y, z);
    cout << "Previous=" << y << ", Next=" << z;
    return 0;
}
```